

### Amendments to the Claims

1. (Currently amended) A process for preparing ~~aromatic compounds~~ ferrocene, bisindenylferrocene or ruthenocene having a structural element of the formula I in the aromatic hydrocarbon ring,



where

M is -Li, -MgX<sub>3</sub>, (C<sub>1</sub>-C<sub>18</sub>-alkyl)<sub>3</sub>Sn-, -ZnX<sub>3</sub> or -B(O-C<sub>1</sub>-C<sub>4</sub>-alkyl)<sub>2</sub>,

X<sub>1</sub> and X<sub>2</sub> are each, independently of one another, O or N and C-bonded hydrocarbon or heterohydrocarbon radicals are bound to the free bonds of the O or N atoms,

the group -C=C- together with carbon atoms forms a hydrocarbon aromatic and

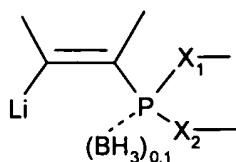
X<sub>3</sub> is Cl, Br or I,

characterized in that ~~an aromatic compound~~ ferrocene, bisindenylferrocene or ruthenocene having a structural element of the formula II in the aromatic ring,



where X<sub>1</sub> and X<sub>2</sub> are as defined above and the group -C=C- together with carbon atoms forms a hydrocarbon aromatic,

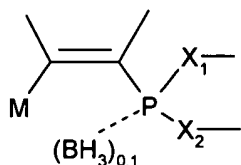
is reacted with at least equivalent amounts of alkyllithium, a magnesium Grignard compound or an aliphatic Li sec-amide or X<sub>3</sub>Mg sec-amide, and, to prepare compounds of the formula I in which M is -MgX<sub>3</sub>, (C<sub>1</sub>-C<sub>18</sub>-alkyl)<sub>3</sub>Sn-, -ZnX<sub>3</sub> or -B(O-C<sub>1</sub>-C<sub>4</sub>-alkyl)<sub>2</sub>, a lithium compound of the formula Ia,



(Ia),

is reacted with at least equivalent amounts of  $\text{Mg}(\text{X}_3)_2$ ,  $\text{Zn}(\text{X}_3)_2$ ,  $(\text{C}_1\text{-C}_{18}\text{-alkyl})_3\text{SnX}_3$  or  $\text{B}(\text{O-C}_1\text{-C}_4\text{-alkyl})_3$ .

2. (Currently amended) ~~A compound~~ Ferrocene, bisindenylferrocene or ruthenocene having a structural element of the formula I in the aromatic hydrocarbon ring,

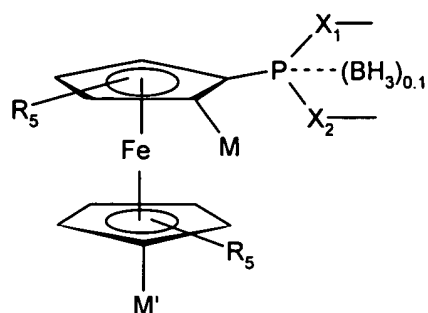


(I),

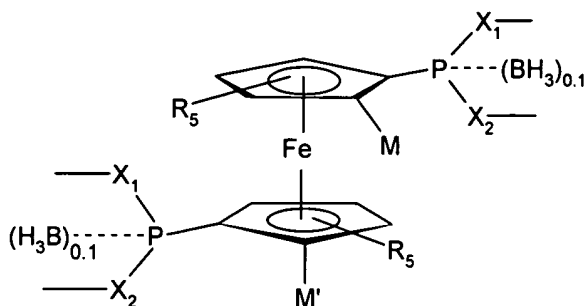
where

M,  $\text{X}_1$  and  $\text{X}_2$  are as defined in claim 1 and the group  $\text{-C=C-}$  together with carbon atoms forms a hydrocarbon aromatic.

3. (Currently amended) ~~The compound~~ Ferrocene, bisindenylferrocene or ruthenocene as claimed in claim 2, characterized in that they have ~~the compound of the formula I is a compound which has a ferrocene skeleton as aromatic compound and corresponds~~ correspond to the formula Ib or Ic,



(Ib),



(Ic),

where

$R_5$  is  $C_1$ - $C_4$ -alkyl and preferably a hydrogen atom,

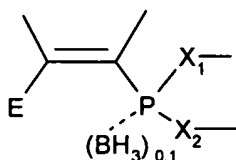
M is -MgCl, -MgBr and preferably Li,

$M'$  is H, -MgCl, -MgBr or Li and

$X_1$  and  $X_2$  and also the radicals bound to free bonds of  $X_1$  and  $X_2$  have the meanings given in claim 1 are each, independently of one another, O or N and C-bonded hydrocarbon or heterohydrocarbon radicals are bound to the free bonds of the O or N atoms.

4. (Cancelled)

5. (Currently amended) A process for preparing aromatic compounds- ferrocene, bisindenylferrocene or ruthenocene having a structural element of the formula III,



(III),

where

$X_1$  and  $X_2$  and also the radicals bound to free bonds have the meanings given in claim 1 and E is the radical of a reactive, electrophilic compound which is able to replace a metal bound to hydrocarbon aromatics or a bound metal group, characterized in that a compound ferrocene, bisindenylferrocene or ruthenocene having a structural element of the formula I,



where

M,  $X_1$  and  $X_2$  and the radicals bound to free bonds have the meanings given in claim 1, is reacted with at least equivalent amounts of a reactive electrophilic compound.

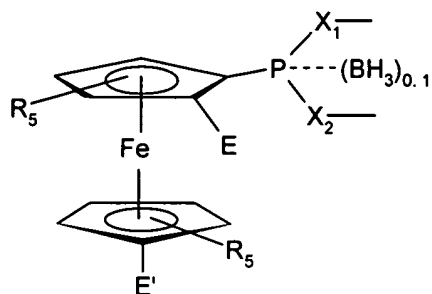
6. (Currently amended) A metallocene from the group consisting of ferrocene, bisindenylferrocene and ruthenocene having a structural element of the formula III in one or both cyclopentadienyl rings,



where

E is the radical of a reactive, electrophilic compound which is able to replace a metal bound to hydrocarbon aromatics or a bound metal group,  $X_1$  and  $X_2$  and hydrocarbon radicals bound to the free bonds of the groups  $X_1$  and  $X_2$  have the meanings given in ~~claims 1 and 5~~ claim 1.

7. (Original) The metallocene as claimed in claim 6, characterized in that it corresponds to the formula IV,

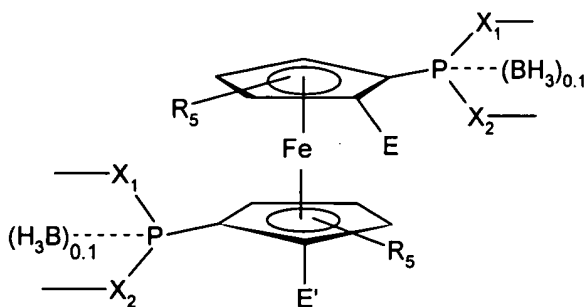


(IV),

where

R<sub>5</sub> is C<sub>1</sub>-C<sub>4</sub>-alkyl and preferably a hydrogen atom, E' is H or independently has one of the meanings of E, and E, X<sub>1</sub> and X<sub>2</sub> and hydrocarbon radicals bound to the free bonds of the groups X<sub>1</sub> and X<sub>2</sub> have the meanings given in claim 6.

8. (Original) The metallocene as claimed in claim 6, characterized in that it corresponds to the formula Iva,

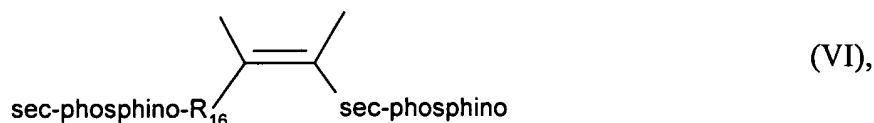


(IVa),

where

E' is H or independently has one of the meanings of E,  
 R<sub>5</sub> is C<sub>1</sub>-C<sub>4</sub>-alkyl and preferably a hydrogen atom and  
 E, X<sub>1</sub> and X<sub>2</sub> and hydrocarbon radicals bound to the free bonds of the groups X<sub>1</sub> and X<sub>2</sub> have the meanings given in claim 6.

9. (Currently amended) A process for preparing ~~hydrocarbon-aromatic~~ ferrocene, bisindenylferrocene or ruthenocene diphosphines having structural elements of the formula VI in an aromatic hydrocarbon ring,



or having structural elements of the formula VIa in each cyclopentadienyl ring of a metallocene,



where

R<sub>16</sub> is a direct bond or a divalent bridging group, with the sec-phosphino in the bridging group being located in the 1, 2 or 3 position relative to the carbon atom of the aromatic ring, and

R<sub>17</sub> is a substituent which is bound via a carbon atom to the aromatic ring,  
which comprises the steps:

a) reaction of ~~an aromatic compound~~ ferrocenes, bisindenylferrocenes or ruthenocenes having structural elements of the formula II



with metalation reagents to form ~~an aromatic compound~~ a ferrocene, bisindenylferrocene or ruthenocene having structural elements of the formula I



where M, X<sub>1</sub> and X<sub>2</sub> and hydrocarbon radicals bound to the free bonds of the groups X<sub>1</sub> and X<sub>2</sub> have the meanings given in claim 1,

b) reaction of ~~the compound~~ ferrocenes, bisindenylferrocenes or ruthenocenes having structural elements of the formula I with an electrophilic and reactive compound, wherein

b1) the compound of the formula I is reacted with a sec-phosphine halide to introduce sec-phosphino,

b2) the compound of the formula I is reacted with an electrophilic reactive compound which has a reactive group which can be replaced by sec-phosphino in the 1, 2 or 3 position and the product is subsequently reacted with a metal sec-phosphate or a secondary phosphine to introduce the group -R<sub>16</sub>-sec-phosphino,

b3) the compound of the formula I is ~~reacted~~ with an electrophilic organic compound which forms an α-carbon atom to introduce the group -R<sub>17</sub>,

c) any borane group present is removed from the compounds obtained in steps b1), b2) or

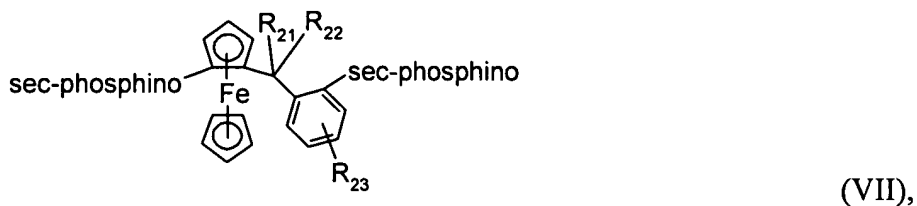
b3) and the radicals (hetero)hydrocarbon-X<sub>1</sub>, (hetero)hydrocarbon-X<sub>2</sub> or X<sub>1</sub>-

(hetero)hydrocarbon-X<sub>2</sub> are subsequently split off to form a -PCl<sub>2</sub> group or -PBr<sub>2</sub> group and the Cl or Br atoms are then replaced by a hydrocarbon radical by means of an organometallic compound to form the sec-phosphino group, or

d) the radicals (hetero)hydrocarbon-X<sub>1</sub>, (hetero)hydrocarbon-X<sub>2</sub> or X<sub>1</sub>-

(hetero)hydrocarbon-X<sub>2</sub> are split off to form a -PCl<sub>2</sub> group or -PBr<sub>2</sub> group and the Cl or Br atoms are then replaced by a hydrocarbon radical by means of an organometallic compound (Grignard reagent) to form the sec-phosphino group and the borane group is then removed.

10. (Currently amended) ~~The A process as claimed in claim 9~~ for preparing 1-( $\alpha$ -substituted ortho-sec-phosphinobenzyl)-2-sec-phosphinoferrocenes of the formula VII in the form of their racemates, mixtures of diastereomers or essentially pure diastereomers,



where

$R_{21}$  is hydrogen,  $C_1$ - $C_6$ -alkyl,  $C_3$ - $C_8$ -cycloalkyl, unsubstituted or F-,  $C_1$ - $C_6$ -alkyl- or  $C_1$ - $C_6$ -alkoxy-substituted phenyl or benzyl,

$R_{22}$  is  $C_1$ - $C_4$ -alkoxy,  $C_1$ - $C_8$ -acyloxy or sec-amino and

$R_{23}$  is hydrogen,  $C_1$ - $C_4$ -alkyl or  $C_1$ - $C_4$ -alkoxy,

which comprises the steps:

a) reaction of a compound of the formula VIII



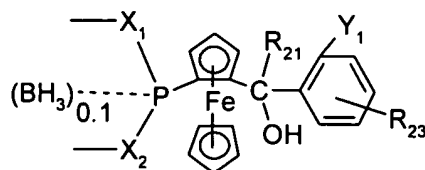
where

M and the group  $-P(X_1)(X_2)---(BH_3)_{0.1}$  are as defined in claim 1, with a compound of the formula IX





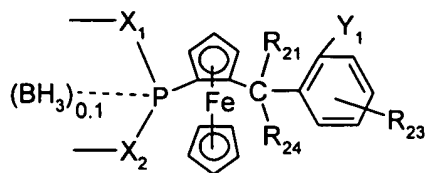
where  $Y_1$  is Cl, Br or I and  $R_{23}$  and  $R_{21}$  are as defined in claim 1, to form a compound of the formula X,



(X),

- b)  $C_1$ - $C_4$ -alkylation or  $C_1$ - $C_8$ -acylation of the OH group in the compound of the formula X or replacement of the acyloxy group formed by sec-amino,
- c) replacement of the halogen  $Y_1$  in compounds of the formula X by sec-phosphino and subsequent conversion of the group  $-P(X_1-)(X_2-)---(BH_3)_{0.1}$  into a sec-phosphino group, or conversion of the group  $-P(X_1-)(X_2-)---(BH_3)_{0.1}$  firstly into a sec-phosphino group and subsequent replacement of the halogen  $Y_1$  in compounds of the formula X by sec-phosphino,
- d) preparation of the diphosphine of the formula VII, by
- d1) removing any borane group present from a compound of the formula X, then splitting off the radicals (hetero)hydrocarbon- $X_1$ , (hetero)hydrocarbon- $X_2$  or  $X_1$ -(hetero)hydrocarbon- $X_2$  to form a  $-PCl_2$  group or  $-PBr_2$  group and then replacing the Cl or Br atoms by a hydrocarbon radical by means of an organometallic compound (Grignard reagent) to form the sec-phosphino group, or
- ~~e2)~~ d2) splitting off the radicals (hetero)hydrocarbon- $X_1$ , (hetero)hydrocarbon- $X_2$  or  $X_1$ -(hetero)hydrocarbon- $X_2$  to form a  $-PCl_2$  group or  $-PBr_2$  group and then replacing the Cl or Br atoms by a hydrocarbon radical by means of an organometallic compound (Grignard reagent) to form the sec-phosphino group and then removing the borane group.

11. (Currently amended) A compound of the formula XI in the form of a racemate, diastereomer or pair of diastereomers,

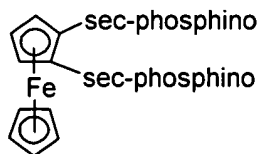


(XI),

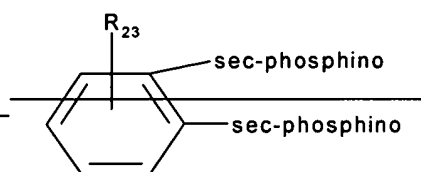
where

~~the group~~  $\text{P}(\text{X}_1)(\text{X}_2) \text{---} (\text{BH}_3)_{0.1}$ ,  $\text{X}_1$  and  $\text{X}_2$  are each, independently of one another, O or N and C-bonded hydrocarbon or heterohydrocarbon radicals are bound to the free bonds of the O or N atoms,  $\text{R}_{21}$ ,  $\text{R}_{23}$  and  $\text{Y}_1$  are as defined in ~~claims 1 and 10~~ claim 10, or  $(\text{X}_1)$  and  $(\text{X}_2)$  in the group  $\text{P}(\text{X}_1)(\text{X}_2) \text{---} (\text{BH}_3)_{0.1}$  are Cl or Br, and  $\text{R}_{24}$  is -OH,  $\text{C}_1$ - $\text{C}_4$ -alkoxy,  $\text{C}_1$ - $\text{C}_8$ -acyloxy or sec-amino.

12. (Currently amended) ~~The A process as claimed in claim 9 for preparing compounds of the formula XII in the form of racemates, diastereomers and pairs of diastereomers and also compounds of the formula XIII,~~



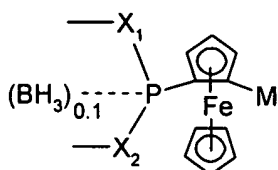
(XII),



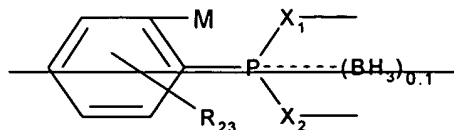
~~(XIII),~~

which comprises the steps

a) reaction of a compound of the formula XIV or XV



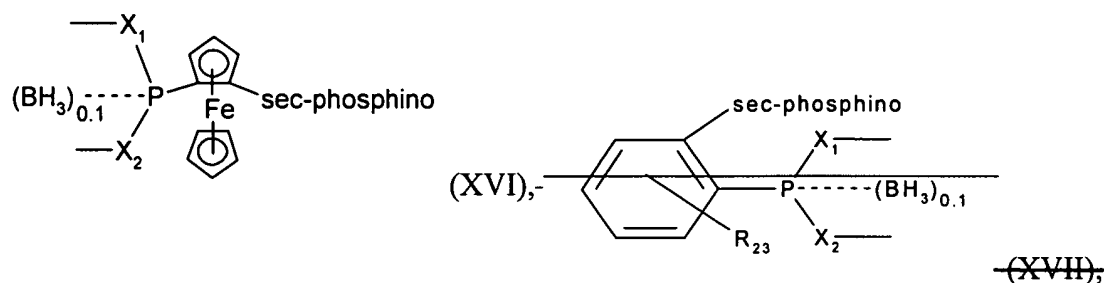
(XIV),



~~(XV),~~

where

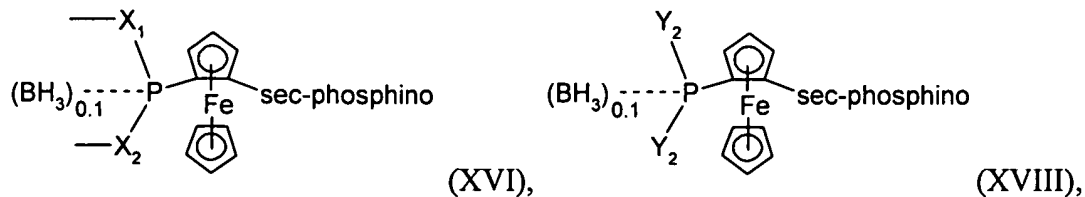
M,  $R_{23}$  and the group  $-P(X_1)(X_2)---(BH_3)_{0.1}$  are as defined in ~~claims 1 and 10~~ claim 1, with a sec-phosphine halide (chloride or bromide) to produce compounds of the formula XVI or XVII,



b) preparation of diphosphines of the formulae XII and XIII by

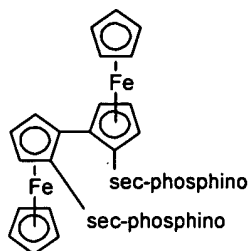
- b1) removing any borane group present from a compound of the formula XVI or XVII, then splitting off the radicals (hetero)hydrocarbon- $X_1$ , (hetero)hydrocarbon- $X_2$  or  $X_1$ -(hetero)hydrocarbon- $X_2$  to form a  $-PCl_2$  group or  $-PBr_2$  group and then replacing the Cl or Br atoms by a hydrocarbon radical by means of an organometallic compound (Grignard reagent) to form the sec-phosphino group, or
- b2) splitting off the radicals (hetero)hydrocarbon- $X_1$ , (hetero)hydrocarbon- $X_2$  or  $X_1$ -(hetero)hydrocarbon- $X_2$  to form a  $-PCl_2$  group or  $-PBr_2$  group and then replacing the Cl or Br atoms by a hydrocarbon radical by means of an organometallic compound (Grignard reagent) to form the sec-phosphino group and then removing the borane group.

13. (Original) A compound of the formula XVI or XVIII in the form of a racemate, diastereomer or pair of diastereomers,



where the group  $-P(X_1)(X_2)---(BH_3)_{0.1}$  is as defined in claim 1 and  $Y_2$  is Cl or Br.

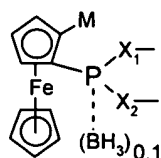
14. (Currently amended) The A process as ~~claimed in claim 9~~ for preparing compounds of the formula XIX in the form of racemates, diastereomers and pairs of diastereomers,



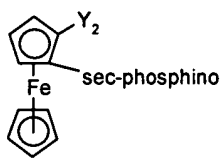
(XIX),

which comprises the steps

a) reaction of a compound of the formula XX with a compound of the formula XXI,



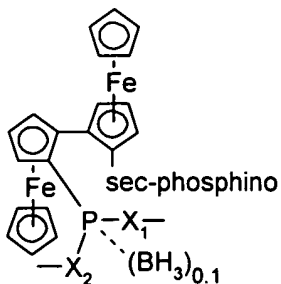
(XX),



(XXI),

where

M is  $-\text{Sn}(\text{C}_1\text{-C}_4\text{-alkyl})_3$  or  $-\text{ZnX}_3$ , the group  $-\text{P}(\text{X}_1-)(\text{X}_2-)\text{---}(\text{BH}_3)_{0.1}$  is as defined in claim 1 and  $\text{Y}_2$  is I or Br, in the presence of a Pd catalyst to form a compound of the formula XXII



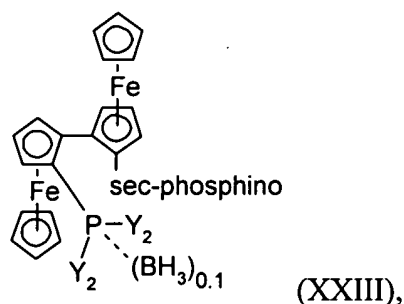
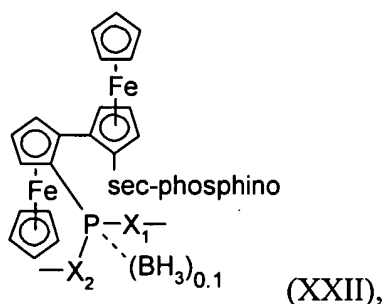
(XXII),

b) preparation of diphosphines of the formula XIX by

b1) removing any borane group present from a compound of the formula XXII, then splitting off the radicals (hetero)hydrocarbon- $X_1$ , (hetero)hydrocarbon- $X_2$  or  $X_1$ -(hetero)-hydrocarbon- $X_2$  to form a  $-PCl_2$  group or  $-PBr_2$  group and then replacing the Cl or Br atoms by a hydrocarbon radical by means of an organometallic compound (Grignard reagent) to form the sec-phosphino group, or

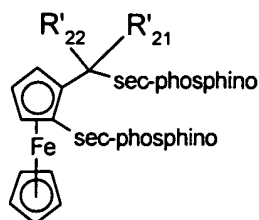
b2) splitting off the radicals (hetero)hydrocarbon- $X_1$ , (hetero)hydrocarbon- $X_2$  or  $X_1$ -(hetero)hydrocarbon- $X_2$  to form a  $-PCl_2$  group or  $-PBr_2$  group and then replacing the Cl or Br atoms by a hydrocarbon radical by means of an organometallic compound (Grignard reagent) to form the sec-phosphino group and then removing the borane group.

15. (Original) A compound of the formula XXII or XXIII in the form of a racemate, diastereomer or pair of diastereomers,



where the group  $-P(X_1)(X_2)---(BH_3)_{0.1}$  is as defined in claim 1 and  $Y_2$  is Cl or Br.

16. (Original) The process as claimed in claim 9 for preparing compounds of the formula XXIV in the form of racemates, diastereomers and pairs of diastereomers,



(XXIV),

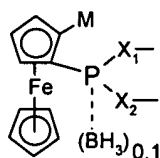
where

$R'_{21}$  is hydrogen or  $C_1$ - $C_6$ -alkyl,

$R'_{22}$  is  $C_1$ - $C_6$ -alkyl,  $C_3$ - $C_8$ -cycloalkyl, unsubstituted or F-,  $C_1$ - $C_6$ -alkyl- or  $C_1$ - $C_6$ -alkoxy-substituted phenyl or benzyl,

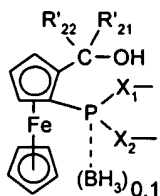
which comprises the steps

a) reaction of a compound of the formula XX,



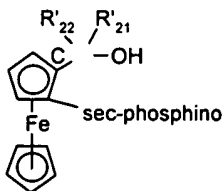
(XX),

with an aldehyde or ketone of the formula  $R'_{21}R'_{22}C(O)$  to form a compound of the formula XXV,



(XXV),

b) preparation of compounds of the formula XXVI,



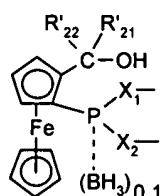
(XXVI),

by

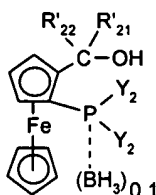
b1) removing any borane group present from a compound of the formula XXV, then splitting off the radicals (hetero)hydrocarbon- $X_1$ , (hetero)hydrocarbon- $X_2$  or  $X_1$ -(hetero)-

hydrocarbon- $X_2$  to form a  $-PCl_2$  group or  $-PBr_2$  group and then replacing the Cl or Br atoms by a hydrocarbon radical by means of an organometallic compound (Grignard reagent) to form the sec-phosphino group, or  
 b2) splitting off the radicals (hetero)hydrocarbon- $X_1$ , (hetero)hydrocarbon- $X_2$  or  $X_1$ -(hetero)hydrocarbon- $X_2$  to form a  $-PCl_2$  group or  $-PBr_2$  group and then replacing the Cl or Br atoms by a hydrocarbon radical by means of an organometallic compound (Grignard reagent) to form the sec-phosphino group and then removing the borane group,  
 c) acylating the compound of the formula XXVI, for example by means of a carboxylic anhydride, and  
 d) replacing the  $C_1$ - $C_8$ -acyloxy group formed by means of a secondary phosphine to give compounds of the formula XXIV.

17. (Currently amended) A compound of the formula XXVII or XXVIII in the form of a racemate, diastereomer or pair of diastereomers,



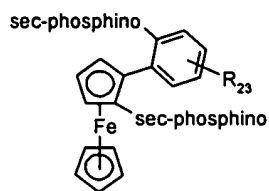
(XXVII),



(XXVIII),

where  $R_{21}$  and  $R_{22}$  are as defined in claim 16,  $Y_2$  is Cl or Br and the group  $-P(X_1)(X_2)-$   $-(BH_3)_{0.1}$  is as defined in claim 1  $X_1$  and  $X_2$  are each, independently of one another, O or N and C-bonded hydrocarbon or heterohydrocarbon radicals are bound to the free bonds of the O or N atoms.

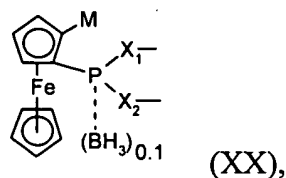
18. (Currently amended) The process as claimed in claim 9 for preparing compounds of the formula XXIX in the form of racemates, diastereomers and pairs of diastereomers,



(XXIX),

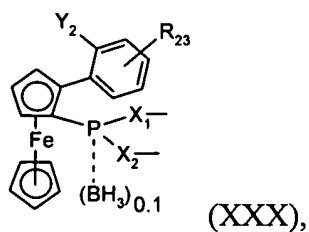
which comprises the steps

a) reaction of a compound of the formula XX



(XX),

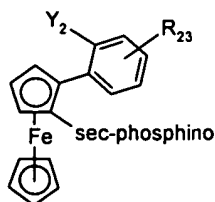
where M is  $-\text{Sn}(\text{C}_1\text{-C}_4\text{-alkyl})_3$  or  $-\text{ZnX}_3$ , ~~the group  $\text{P}(\text{X}_1-)(\text{X}_2-)(\text{BH}_3)_{0.1}$  is as defined in claim 1~~  $\text{X}_1$  and  $\text{X}_2$  are each, independently of one another, O or N and C-bonded hydrocarbon or heterohydrocarbon radicals are bound to the free bonds of the O or N atoms, with 1-bromo-2-iodobenzene or 1,2-diiodobenzene in the presence of a Pd catalyst to form a compound of the formula XXX,



(XXX),

where  $\text{Y}_2$  is bromine or iodine,

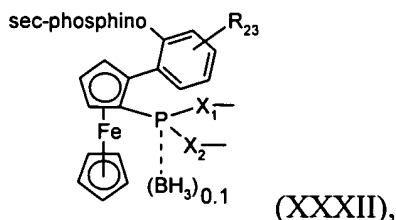
b) to prepare monophosphines of the formula XXXI



(XXXI),



- b1) removing any borane group present from a compound of the formula XXX, then splitting off the radicals (hetero)hydrocarbon- $X_1$ , (hetero)hydrocarbon- $X_2$  or  $X_1$ -(hetero)-hydrocarbon- $X_2$  to form a  $-PCl_2$  group or  $-PBr_2$  group and then replacing the Cl or Br atoms by a hydrocarbon radical by means of an organometallic compound (Grignard reagent) to form the sec-phosphino group, or
- b2) splitting off the radicals (hetero)hydrocarbon- $X_1$ , (hetero)hydrocarbon- $X_2$  or  $X_1$ -(hetero)hydrocarbon- $X_2$  to form a  $-PCl_2$  group or  $-PBr_2$  group and then replacing the Cl or Br atoms by a hydrocarbon radical by means of an organometallic compound (Grignard reagent) to form the sec-phosphino group and then removing the borane group, and
- c) then replacing the bromine or iodine atom by a sec-phosphino group by metalation by means of a lithium alkyl (butyllithium) and subsequent reaction with a sec-phosphine halide, or
- d) to prepare compounds of the formula XXXII

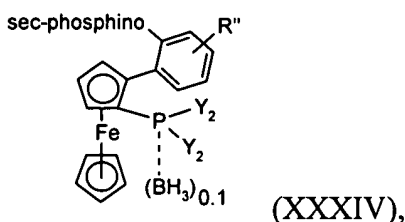
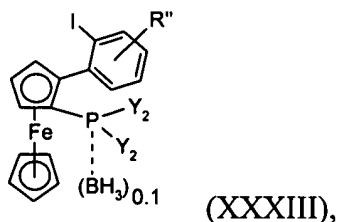
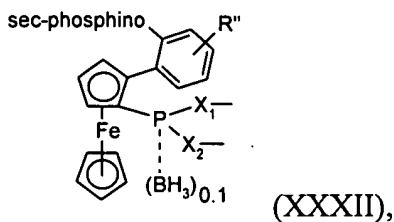
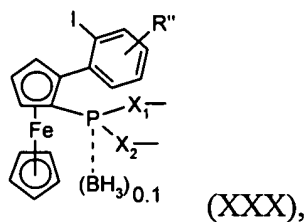


reacting a compound of the formula XX with ortho-sec-phosphinophenyl iodide in the presence of metal halides such as  $ZnBr_2$  and Pd catalysts, and

- d1) removing any borane group present from a compound of the formula XXXII, then splitting off the radicals (hetero)hydrocarbon- $X_1$ , (hetero)hydrocarbon- $X_2$  or  $X_1$ -(hetero)-hydrocarbon- $X_2$  to form a  $-PCl_2$  group or  $-PBr_2$  group and then replacing the Cl or Br atoms by a hydrocarbon radical by means of an organometallic compound (Grignard reagent) to form the sec-phosphino group, or
- d2) splitting off the radicals (hetero)hydrocarbon- $X_1$ , (hetero)hydrocarbon- $X_2$  or  $X_1$ -(hetero)hydrocarbon- $X_2$  to form a  $-PCl_2$  group or  $-PBr_2$  group and then replacing the Cl

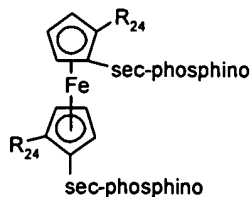
or Br atoms by a hydrocarbon radical by means of an organometallic compound (Grignard reagent) to form the sec-phosphino group and then removing the borane group.

19. (Original) A compound of the formula XXX, XXXII, XXXIII or XXXIV in the form of a racemate, diastereomer or pair of diastereomers,



where the group  $-P(X_1)(X_2)---(BH_3)_{0.1}$  is as defined in claim 1,  $Y_2$  is Cl or Br and  $R''$  is hydrogen or a substituent.

20. (Currently amended) The process as claimed in claim 9 for preparing compounds of the formula XXXV in the form of racemates, diastereomers and pairs of diastereomers,



(XXXV),

where

$R_{24}$  is a radical of the formula  $-CR_{25}R_{26}-Y_3$  or a group  $R_{28}$ ,

R<sub>25</sub> is hydrogen, C<sub>1</sub>-C<sub>6</sub>-alkyl, C<sub>3</sub>-C<sub>8</sub>-cycloalkyl, unsubstituted or F-, C<sub>1</sub>-C<sub>6</sub>-alkyl- or C<sub>1</sub>-C<sub>6</sub>-alkoxy-substituted phenyl or benzyl,

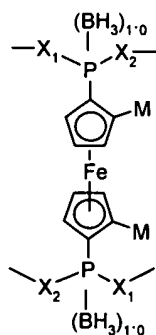
R<sub>26</sub> is C<sub>1</sub>-C<sub>6</sub>-alkyl, C<sub>3</sub>-C<sub>8</sub>-cycloalkyl, unsubstituted or F-, C<sub>1</sub>-C<sub>6</sub>-alkyl- or C<sub>1</sub>-C<sub>6</sub>-alkoxy-substituted phenyl or benzyl,

Y<sub>3</sub> is C<sub>1</sub>-C<sub>4</sub>-alkoxy, C<sub>1</sub>-C<sub>8</sub>-acyloxy or sec-amino and

R<sub>28</sub> is C<sub>1</sub>-C<sub>6</sub>-alkyl, C<sub>3</sub>-C<sub>8</sub>-cycloalkyl, unsubstituted or F-, C<sub>1</sub>-C<sub>6</sub>-alkyl- or C<sub>1</sub>-C<sub>6</sub>-alkoxy-substituted phenyl or benzyl,

which comprises the steps

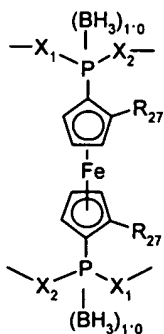
a) reaction of a compound of the formula XXXVI



(XXXVI)

where

the group  $\text{P}(\text{X}_1)(\text{X}_2) - (\text{BH}_3)_{0.1}$  is as defined in claim 1 X<sub>1</sub> and X<sub>2</sub> are each, independently of one another, O or N and C-bonded hydrocarbon or heterohydrocarbon radicals are bound to the free bonds of the O or N atoms, with an aldehyde or ketone or imine of the formula CR<sub>25</sub>R<sub>26</sub>=Y<sub>4</sub>, where Y<sub>4</sub> is =O or =N(C<sub>1</sub>-C<sub>4</sub>-alkyl), or with a halide R<sub>28</sub>Y<sub>6</sub>, where Y<sub>6</sub> is Cl, Br or iodine, to form compounds of the formula XXXVII



(XXXVII),

where

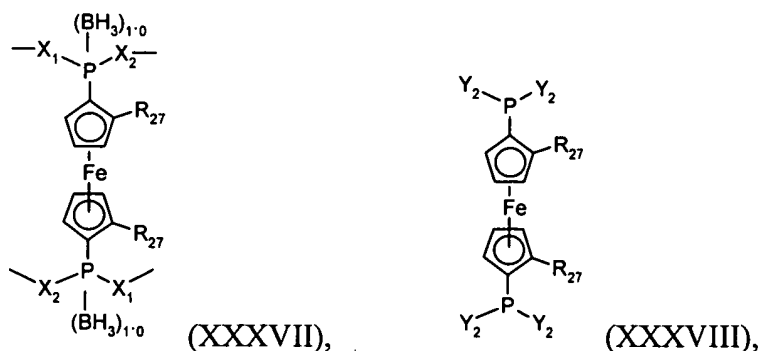
R<sub>27</sub> is the group -CR<sub>25</sub>R<sub>26</sub>-Y<sub>5</sub> or R<sub>28</sub>, where R<sub>25</sub> and R<sub>26</sub> are as defined above and Y<sub>5</sub> is -OH or -NH(C<sub>1</sub>-C<sub>4</sub>-alkyl), alkylating the NH group, if appropriate alkylating or acylating the OH group and, if appropriate, replacing the acyloxy group by sec-amino and

b) to prepare compounds of the formula XXXV

b1) removing any borane group present from a compound of the formula XXXVII, then splitting off the radicals (hetero)hydrocarbon-X<sub>1</sub>, (hetero)hydrocarbon-X<sub>2</sub> or X<sub>1</sub>-(hetero)-hydrocarbon-X<sub>2</sub> to form a -PCl<sub>2</sub> group or -PBr<sub>2</sub> group and then replacing the Cl or Br atoms by a hydrocarbon radical by means of an organometallic compound (Grignard reagent) to form the sec-phosphino group, or

b2) splitting off the radicals (hetero)hydrocarbon-X<sub>1</sub>, (hetero)hydrocarbon-X<sub>2</sub> or X<sub>1</sub>-(hetero)hydrocarbon-X<sub>2</sub> to form a -PCl<sub>2</sub> group or -PBr<sub>2</sub> group and then replacing the Cl or Br atoms by a hydrocarbon radical by means of an organometallic compound (Grignard reagent) to form the sec-phosphino group and then removing the borane group.

21. (Currently amended) An intermediate in the form of a racemate, diastereomer or pair of diastereomers, ~~in particular an intermediate of the formula XXXVII or XXXVIII,~~



where

R<sub>27</sub> and Y<sub>2</sub> ~~are~~ is as defined in claim 1 and the group P(X<sub>1</sub>)(X<sub>2</sub>)-(BH<sub>3</sub>)<sub>0.4</sub> is as defined in claim 1 20. X<sub>1</sub> and X<sub>2</sub> are each, independently of one another, O or N and C-bonded hydrocarbon or heterohydrocarbon radicals are bound to the free bonds of the O or N atoms, and Y<sub>2</sub> is Cl or Br.